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Reflective Teaching

Abstract

Reflective teaching is not a new idea. However, it is only in recent years that the term "reflective practitioner" has become a catchword in educational circles. This paper gives a short theoretical background on reflective teaching, provides some information about the tools which can be used for reflection, and elaborates the author's own experience with reflection. The purpose of this paper is to provide teachers with a working model which can initiate them on the path of reflection.

Résumé

L'enseignement réflexif n'est pas une idée nouvelle. Toutefois, cela fait à peine quelque années que l'expression "praticien réflexif" est devenue un mot d'ordre dans les cercles éducatifs. Le présent article fait une brève rétrospective théorique de l'enseignement réflexif, fournit certains renseignements sur les instruments qui peuvent servir à la réflexion et décrit la propre expérience de l'auteur en matière de réflexion. Son objectif est de fournir aux enseignants un modèle de travail qui pourra les lancer sur le chemin de la réflexion.

For each of us, the more we understand ourselves and can articulate reasons why we are what we are, do what we do and are headed where we have chosen, the more meaningful will the teaching and learning experience in our classrooms be. The process of making sense and meaning of the teaching and learning taking place in classrooms is both difficult and rewarding. Much personal knowledge is tacit, unnamed and because it is embodied in practice, difficult for us to make explicit. One way of coming to know ourselves is to think back and reflect on our personal and practical knowledge. This is helpful in understanding ourselves as teachers and provides us with a means of playing a more active role in curriculum development and practice (Connelly & Clandinin, 1988).

Reflecting on the teaching and learning which takes place in the classroom is very helpful both in terms of personal growth as a teacher as well as in the development of a philosophy of teaching, learning, and curriculum. It can be a useful tool in self-evaluation as well as a means of evaluating situations which occur in the classroom.

In this paper I will outline some background information on reflective teaching, provide some information about the tools which can be used in reflection, and describe my own experience with reflection. The purpose of this paper is to provide teachers with a working tool which can perhaps initiate them

on the path of reflection and "lay the foundations for an ongoing critical appraisal of customary practices and beliefs in the classroom which is essential if teachers are to be creative professionals rather than mere functionaries" (Sikes & Troyna, 1991, p. 6).

Reflective teaching

Reflective teaching is not a new idea. Dewey (1933) referred to it in his early work as the "active, persistent and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it" (p. 7). However, it is only in recent years that the term "reflective practitioner" has become a catch-word in educational circles. The term became popular when Schon (1983) began to write about reflective practice in education and other professions. This shift in interest in reflective thinking came about partly as a reaction to the overly technical and simplistic view of teaching that dominated the 1980s. Nowadays, however, professional knowledge is seen as coming both from sources outside the teacher and from teachers' own interpretations of their everyday experiences (Sparks-Langer & Colton, 1991).

Schon (1983) describes two main kinds of reflection, reflecting-in-action and reflecting-on-action. His ideas are based on the assumption that when we go about doing the everyday actions of our lives we know what we are doing. However, this knowledge is tacit, implicit and often cannot be explained; "our knowing is in our action" (Schon, 1983, p. 49). Sometimes we think about these actions even when we are doing them and this is what Schon (1983) refers to as reflecting-in-action which occurs when practitioners

> . . . think about what they are doing, sometimes even while doing it. There is some puzzling or troubling or interesting phenomenon with which the individual is trying to deal. As he tries to make sense of it, he also reflects on the understandings which have been implicit in his action, understandings which he surfaces, criticizes, restructures, and embodies in further action. (p. 50)

A practitioner may also reflect on his or her actions in retrospect, what Schon (1983) calls reflecting-on-action. Through reflection the practitioner can surface and criticize the tacit understandings that have grown up around the repetitive experiences of specialized practice and can make new sense of the situations of uncertainty or uniqueness which he may allow himself or herself to experience.

Reflection can occur instantaneously at the very moment when the action is taking place. Reflection-in-action can take place in the classroom when for example the teacher is trying to understand why a student cannot solve a problem. Reflection can also occur as part of professional thought after the action has already taken place. Reflecting-on-action occurs when a teacher sits

back and thinks back over a particular lesson and how it could be done differently if it had to be taught again. Schon (1987) states that while teachers acquire some professional knowledge from packaged educational principles and skills, the bulk of their learning comes through continuous action and reflection on everyday problems. As a teacher

> . . . reflects on the phenomena before him, and on the prior understandings which have been implicit in his behaviour, he carries out an experiment which serves to generate both a new understanding of the phenomena and a change in the situation. When someone reflects-in-action, he becomes a researcher in the practice context. He is not dependant on the categories of established theory and technique, but constructs a new theory of the unique case. (Schon, 1983, p. 68)

Reflection enables teachers to become owners of their own knowledge which they can use to instigate change and assume an active role in both their classroom practice as well as in curricular decisions.

Types of reflection

Sparks-Langer and Colton (1991) describe three different kinds of reflective thinking. The first is cognitive reflection which describes how teachers process information and make decisions. The second, critical reflection, focuses on the substance that drives the thinking - experiences, goals, values, and social implications. The final type of reflection, teachers' narratives, refers to teachers' own interpretations of the events which occur within their particular contexts.

The cognitive element. Cognitive reflection focuses on how teachers use their knowledge of content, pedagogy, curriculum, learners, and educational goals in their planning and decision making. Teachers have their own personal constructs which are "a personal construction or representation of some aspect of reality that is the result of an individual's interpretation of his world" (Bussis & Chittenden, 1974, p. 2). Our interpretation of events is related to experience and based on each individual's past history. This helps us to build a network of related facts, concepts, generalizations, and experiences which are described as "schemata". Studies carried out by Borko and Livingston (1989) which compare novice and expert teachers show that novices experience difficulties when the students lead them away from prescripted lesson plans. Experts are better able to improvise because many of the routines are readily available in memory and secondly their rich schemata allow them to consider cues in their environment and access appropriate strategies. The implication of these studies is that if student teachers are encouraged to reflect upon their actions and consider not only the effect of the action but also the cognitive processes

involved in making the decisions they will be able to handle situations in the classroom much better.

The critical element. While the cognitive element of reflection emphasizes how teachers make decisions, the critical approach stresses the substance that drives the thinking - the experiences, beliefs, sociopolitical values, and goals of teachers (Sparks-Langer & Colton, 1991). In critical reflection, the moral and ethical aspects of social compassion and justice are considered along with the means and the ends. For instance, in a science classroom, one might make arrangements to encourage cooperative learning in the hope of fostering acceptance among students.

McLaren (1989) highlights the importance of teachers thinking about the dilemmas of teaching and the social outcomes of education. Teachers can then begin to question common practices such as tracking, ability grouping, competitive grading and behavioral control. They begin to clarify their own beliefs about the purposes of education and to critically examine teaching methods and materials to look for hidden lessons about equity and power that might lie therein.

What does all this mean to a reflective practitioner? According to Smyth (1989) as teachers describe, analyze, and make inferences about classroom events, they are creating their own pedagogical principles which help to make sense of what is going on and guide further action.

Teachers' narratives. Cochran-Smith and Lytle (1990) write: "what is missing from the knowledge base of teaching, therefore, are the voices of the teachers themselves, the questions teachers ask, the ways teachers use writing and the interpretive frames teachers use to understand and improve their own classroom practices" (p. 2). This is the essence of the narrative part of reflection. While a teacher's narrative may include cognitive or critical aspects, the emphasis is on the teacher's own interpretations of the context in which professional decisions are made. "Such narratives can be a powerful force in heightening teachers' awareness of their own professional reasoning" (Sparks-Langer & Colton, 1991, p. 41). Narratives give us insights into what motivates a teacher's actions and an appreciation for the complexity of teachers' everyday lives. Teachers themselves can use these narratives as a form of self-evaluation which can give them huge insights into the teaching and learning process.

Teachers' construction of ideas about teaching, learning, schooling, and curriculum - based on cognitive and critical reflection and expressed through narrative - will greatly influence how they interpret all that is taking place in the classroom. Reflection allows for a flexible and thoughtful approach to teaching and learning which enables teachers to evaluate themselves and the situation and give meaning to decisions made. Reflection, however, does not occur randomly or on the spur of the moment; it is a continuous process which requires time and effort. As Wellington (1991) states: "reflective practice

reminds us that the roots of our profession lie in service to people rather than systems. It heralds renewal, reclamation and change, it invites our participation" (p. 5). But what kind of action needs to be taken for a teacher to engage in reflective thinking and teaching ?

Reflection in Action

Smyth (1989) suggests that "if teachers are going to uncover the nature of the forces that inhibit and constrain them, and work at changing those conditions, they need to engage in four forms of action with respect to their teaching" (p. 5). This action can be characterized by a number of questions which demand active answers. First, "what do I do?" attempts to elicit a simple observational description of practice. Second, "what does this mean?" seeks to discover the principles of theories-in-use which underlie and drive the described practice. Building further, the third question, "how did I come to be this way?" forces our awareness beyond the classroom. It appropriately situates educational practice within a broader cultural milieu and it correctly reveals educational practice as political. The final question, "how might I do things differently?" gives us the call to action.

Describing. Elliott (1987) argues that to articulate adequately the principles that lie behind teaching, teachers must start with a consideration of current practice as the way of gaining entry to the "knowledge, beliefs and principles that they employ in both characterizing that practice and deciding what should be done" (p. 151). As teachers reflect about their own or one another's teaching, they describe concrete teaching events. There are a number of tools which can be used to describe teaching such as journal or diary writing. A journal is a way of building up an account of teaching as a basis for analysis and discussion with colleagues. Having to write a narrative of what was occurring in confusing, perplexing, or contradictory situations helps teachers to organize an account of teaching that is crucial to their finding and speaking in their own voices (McDonald, 1986). As Shor (1980) states, when teachers keep journals they are able to "extra-ordinarily re-experience the ordinary" in a way that is clearly based on a sense of the concrete in their working lives.

Informing. When teachers describe their teaching, it is not an end in itself; it is a precursor to uncovering the broader principles that are informing (consciously or otherwise) their classroom action (Smyth, 1989). Through writing their own stories, teachers can uncover the pedagogical principles which underlie their actions and develop operational theories. This will help teachers to develop their own defensible practical principles "grounded in a largely tacit knowledge of complex and particular situations" (Elliott, 1987, p. 152). As Kohl (1983) aptly puts it:

> Unless we (as teachers) assume the responsibility for theorymaking and testing, the theories will be made for us by.the academic researchers and many other groups that are simply filling the

> vacuum that teachers have created by bargaining away their educational power and giving up their responsibilities as intellectuals. (p. 30)

Confronting. If teachers are to be clear about what it is that they are doing as educators and why it is done, then they also have to question their theories and descriptions. As Smyth (1989) states:

> Above all we need to regard the views we hold about teaching not as idiosyncratic preferences, but rather as the product of deeply entrenched cultural norms that we may not even be aware of. Locating or situating teaching in a broader cultural, social, and political context amounts to engaging in critical reflection about the assumptions that underlie those methods and classroom practices. (p. 7)

In this way teaching becomes an expression of shaped values. When teachers write their own biographies and how they feel these have shaped the construction of their values, then they are able to see more clearly how social and institutional forces beyond the classroom and school have been influential.

Reconstructing. Being able to locate oneself both personally and professionally in history in order to be clear about the forces that have come to determine one's existence is the hallmark of a teacher who has been able to harness the reflective process and can begin to act on the world in a way that amounts to changing it. Being reflective, therefore, means starting with reality, with seeing the injustices of reality's limits, and beginning to overcome reality by reasserting the importance of learning.

Tools for reflection

Shulman (1987) describes reflection as "what a teacher does when he or she looks back at the teaching and learning that has occurred, and reconstructs, reenacts, and/or recaptures the events, emotions and the accomplishments" (p. 19). These events need to be recorded to enable reflection to take place and there are several tools which can be used for reflection when working either individually or with colleagues.

Working by oneself. Connelly and Clandinin (1988) suggest several tools for reflection. They discuss journal keeping, biography, picturing, and document analysis as methods appropriate to aiding reflection when there is no other teacher with whom to work. This section will discuss these methods and include examples from the writer's experience of working with these various tools.

Journal keeping. Connelly and Clandinin (1988) describe journal keeping as an "account of our daily actions and our thoughts about those actions. The

journals are ongoing records of practices and reflections on those practices" (p. 34).

I began to keep a journal during my first teaching practice and I found it to be a very useful tool for self-evaluation. I could write down all that occurred during a particular lesson, what I liked and did not like about the lesson, and make suggestions about how I could do it better the next time. Gradually as my journal developed I started to write down feelings and ideas which I had. Several times these would include my frustrations as a teacher such as grumbles about lack of apparatus, or anger about streaming and labelling students. All these ideas helped me to develop my own philosophy of teaching and when I looked back at my writings I could see clearly the evolution of my ideas. Later on I also began to include student comments and ideas in my journals as these student evaluations of my teaching helped to open my eyes on several occasions and allowed me to change and improve whatever I was doing. Here is an example from my journal.

Journal Entry, October 25th 1989.

Today I had a strange experience in my Form 1 (age 11) science class. I had prepared a unit on measurement and to make the lesson more interesting I wanted the students to measure their own height and weight. I put out meter rulers and raided my home and friends' houses to come up with five bathroom scales which the students would use to measure their weight. I put up a chart on the wall with all the students' names with boxes where they could fill in their height and weight. Everyone was having fun and [was] busy taking measurements when all of a sudden the classroom went haywire. A group of students had gathered at the front of the room and were shouting and jeering. I ran to the front of the class and asked them what had happened. "Tanya's bust the balance, the balance couldn't take her weight...Look how fat she is, she's like an overgrown elephant," yelled half a dozen voices. Tanya burst into tears and rushed out of the class saying that she never wanted to do science again.

I felt terrible about this; I tried to explain to the students how cruel they had been but the damage had already been done. Perhaps next time I should give this explanation beforehand and try to explain that everyone is special and that no-one should laugh at anyone else. I could also make the activity optional, so that students would have the choice of measuring their weights. Anyway it is a good lesson to learn and I hope that next time I will be able to handle the situation much better than I did this time.

This journal entry includes a description of a particular classroom incident. I noted the behaviour of the students, my own behaviour, and what was taking place. I also tried to think of how I could have handled the situation

differently. Writing this down helped me to clarify my ideas and reason out what I could do better in the future.

When teachers first start to use journals they may have a number of questions, such as where to write, when to write, and what to write. Everyone usually develops their own system but I like to write my entries in a hard-bound notebook as it makes me feel as if I am writing my own book. I usually write down anything that comes to my mind, descriptions of actions, students and reactions. I also write down my feelings about what happened, reactions to books or articles I have read and how they influence my teaching. I also like to include student sayings and ideas as I find that they help me to understand the learning process. I try to write as regularly as I can, sometimes every day, sometimes every two or three days as I know that to be helpful a journal has to be an ongoing process. I also find that it is useful to go back and reread entries from time to time to make sense of the kinds of things that are important to me. This helps me to evaluate myself and build up my own personal philosophy of teaching and learning.

Biography. Another tool which Connelly and Clandinin (1991) find useful is writing a biography or autobiography. Biographical work has been found to be a valuable way of encouraging critical reflection and enhancing personal and professional development (Sikes & Troyna, 1991). Writing an autobiography helps individuals to understand their own experiences as teachers and the background which helped to build these experiences. Educational experiences often determine our ideas about education and teaching and learning. I tried writing my own autobiography when I was trying to sort out my own ideas for my monograph and explain to my professors why I was interested in doing what I was doing.

> *My first teaching experience was at Cospicua Girls Secondary School, in Malta, and I have taught in this school for the last two years. At first I was terrified of having to teach in this school, as it is a school which has a bad reputation and everyone talks about how many problems the teachers have with their students. When I started to teach there, I loved it from the start. The students were not very motivated but if you showed them that you cared about them as individuals, they gave you their heart. In my experience, however I became very angry at the labels which were being attached to these students, and how everyone (including the students themselves) thought that they were good for nothing. Because in my own classes I could see students making a real effort and getting somewhere I wanted to explore what they wanted to learn in science and how I could make science more interesting for them.*

My own story of my experience with teaching showed me, once I had written it down, where my educational convictions were coming from. My

experiences with the students helped me to develop my own educational goals and ideals. I had never really thought about this before I sat down and started to write.

An autobiography can be as long as one page or a whole book. It can be written anywhere, on a sheet of paper, or in a bound notebook. As you reread the autobiography you can look out for things that suggest patterns or themes which can easily help you to clarify ideas.

Picturing. Another reflective tool is picturing. This involves taking a number of concepts such as curriculum and the school, and building a picture in our minds. The pictures we create are part of our experience and have emotional dimensions. Picturing can be useful in helping us to understand our personal constructs. For example, when I think of "self-fulfilling prophesy," the picture which comes to my mind is that of Carol, one of my ex-students who was very creative but because of the poor self-image she had of herself always failed her exams.

Picturing can be used at the very start of reflection when we are trying to recapture a moment in the classroom or think about a particular idea. I often sit down at my desk and before I start to write, I close my eyes and build up a picture of my ideas, often I start to hear the sounds and smell the smells in the air. This picture helps me to get in touch with the reality of my ideas so that I am better able to express them. Then I can record these ideas in my journal.

Document analysis. The use of lesson plans, schemes of work, time-tables, teacher notes, and student records are described by Walker (1985) as a useful tool for reflection. These have to be used in conjunction with other tools for reflection, such as journals, to become useful. However, it is important to go over lesson plans before, for example, planning a new course, reflecting on how your theoretical views have changed, and how the old plans can be reorganized or reformulated to form new ones. This is what I wrote in one of my journal entries.

Journal Entry, 10th March, 1989.

> *Many of the areas that I felt were important still remain so. The big difference is that now I really understand what I am doing. Before I used to plan fun lessons which were successful but I never really knew why. Now I can look back more analytically and understand why some areas were weak and why some areas were so much better. The most important aspect to me now is that the students are engaged in discovery and "hands-on" activities and I am excited about trying this out with my students.*

Any type of documents can be analyzed and reflected upon. It is very powerful to reflect upon previous plans and realize the change and the growth which has occurred in your ideas which now make you view things in a different light. It is a form of critical self-evaluation without which the learning process would become dry and stagnant and growth would be hindered.

Working with others

Reflection is not necessarily something which takes place in isolation. It can also be used when you are able to work with a colleague or a group of colleagues. Connelly and Clandinin (1988) suggest four methods for carrying out this type of reflection. These include storytelling, letter writing, teacher interviews, and participant observation.

Storytelling. A tool which is important in helping teachers to reflect on their own personal knowledge is storytelling. The stories may be about teachers, students, or incidents which happen in the school or the classroom. The stories can then be shared with trusted colleagues, so that together the patterns and themes which appear in the story can be questioned. This is a story about a classroom situation which I wrote some time ago; it is written in the student's own voice as that made much more meaning to me at the time.

> *Today we had a very special lesson. The teacher Mrs. Bell showed us a film about how we were born. I was so excited, I couldn't wait to see the cute babies. The first part of the film was really funny with pictures of boys and girls and how they grow up. Jane was giggling so hard that she almost fell off her chair. But then the horrible part came. The mummy was lying in a bed and she was screaming. I think she must have been hurting. Then there was a lot of blood. Everyone began to cover their eyes. I kept mine open because I wanted to see but then I could stand it no more. I began to feel my head swim and the next thing I know is that I was on the floor with someone putting water on my face. I was soon feeling better, but there is one thing which I am sure of is that I am never going to have a baby in my life.*

I wrote this story while I was grappling with some of my own ideas about teaching science, and the way in which some aspects of science can be a cause of distress to some students. It helped me to deal with such a situation in my own classroom and when I discussed the story with some of my colleagues, they were able to offer stories from their own experience and give suggestions about the way in which such a situation could be avoided.

Letter writing. Dialogue between professionals. Another important tool of reflection is an ongoing dialogue between two teachers. Letter writing is

similar to journal writing in that it sets out descriptions of events, feelings, and reactions, only in this case it involves a written dialogue with another practitioner. I have found letter writing useful as in many cases it helps us to focus our own thoughts and ideas and point out things which we did not consider important. Sometimes I get so caught up in what I think, that I ramble on and on and it is very useful to me to have a colleague point out certain things and bring me back into focus. This is an excerpt from an exchange of ideas between me and a colleague.

Dear Mary,

I have started observing some lessons of one of my colleagues and finding out that the teacher is teaching science in a "chalk and talk" method. I have also started to talk to some of my form 3 students and they are telling me, that when they are learning science, the topic does not matter but what makes the lesson interesting is the way in which the teacher presents the material. Imagine after all my previous talk about how irrelevant the science curriculum is.

Dear Deborah,

Why are you observing the class? Can you extrapolate from this particular teacher to a larger set of teachers. Is it worthwhile to carry out such an observation? Are you learning more about the importance of the teacher, as opposed to the relevance of the topic? What are the implications of this? Keep going; this could be very interesting.

In this letter exchange you can see me reflecting on my own work and on my own ideas. Sharing them with a colleague who asked very pertinent questions, helped me to think more about what I was doing and to focus my ideas. Also getting encouragement from a colleague confirmed that what I was doing had some meaning, as it was of interest to others besides myself.

Teacher interviews. Yonemura (1982) describes teacher-teacher conversations as "serious examinations of and reflections upon the practices and underlying theories of one teacher to which another gives undivided and supportive attention at times set apart for this." Teachers are given the following opportunities in their conversations: to reflect on and appreciate teaching as a practical art; to gain some release from the isolation and tensions of teaching; and to attain a higher level of congruence between espoused theories and beliefs about teaching and actual practice. Yonemura (1982) notes that "out of these reflective, supportive conversations a clearer identification of the practical principles guiding teachers can be formulated." Recently, I had an interesting interview with the school principal.

Headmistress: *I noticed that the students have a certain relationship with you.*

Myself: *. . .they have found someone whom they can talk to. . .*

Headmistress: *. . .but they don't give you the chance...because I think that they are so used to the fact that authority is against them that automatically when they are in front of someone in authority there is a barrier, they shut you out so the communication is broken. . .*

Myself: *. . .maybe that's true. . . maybe they felt that I was different because I would answer any questions that they would ask me. . .what makes me angry is that they think that they are stupid. . .*

Headmistress: *. . .not only your girls have that mentality. . . the whole school, they have a certain inferiority complex that they are good for nothing. . . they and their parents, it's the same thing. . .*

This interview contains rich, concrete detail about teaching and the learners in the school. There is a reflection of the emotional, moral, and aesthetic dimensions of practical knowledge.

The interview is agreed upon beforehand and it is not simply a conversation between two teachers but rather it is a discussion of the teacher's work in education, her thoughts, her feelings, and how she has come to engage in the work of teaching. The interview can be tape-recorded and then transcribed. The data from the interview can then be used in the further preparation and clarification of your account of your own personal practical knowledge.

Participant observation. Connelly and Clandinin (1988) suggest that one of the most useful tools for reflection is participant observation. This is the participation in the ongoing work in someone else's classroom while engaged in making observations on the student and teacher activities, conversations, materials, events, and so on as well as one's own activities. In September, I was lucky enough to be a participant observer in the science classroom of one of my colleagues.

While in the classroom, I noticed that the teacher would very often write notes on the blackboard. Often he would start the lesson with the writing of notes without giving an explanation and the students would very rarely know what he was talking about. While he is writing on the board, the students are preoccupied with the colour of the pen they should write with, whether to skip a line or draw a margin. The teacher leaves a blank line in the notes for the students to fill in. He hints at the answer when the students cannot provide it.

Note: *Maps give us _____ about the environment.*
Teacher: *What's the answer... in...*
Student: *information...*
Student: *...what's information ?*
Teacher: *...informazioni... (gives literal Maltese translation) what does environment mean ?*
Student: *...ambjent...*
Teacher: *...yes, but what does it really mean ?*
Student: *...ambjent...*
Teacher: *...it is a place...*

It is possible to learn a great deal about a teacher's personal practice from participant observation conducted over a period of time. For example, this particular excerpt from my field notes, shows that the teacher lectures often, writes a large amount of notes on the board, and there is very little student participation in the classroom. The conversation also indicates that while the students seem to know how to translate the meanings of words from Maltese to English or vice-versa, they have not grasped the concept of the word. For many teachers, when the students know what a word means in Maltese, then they have understood everything. From my participant observation, I realized that this is not always the case, and it opened up a whole new set of questions and ideas.

These tools are very easy to use, and if used on a continual basis they can form the basis of constructing one's own personal knowledge. Reflection has played an important role in my own growth as a teacher, but how did reflection help me to grow ?

My personal growth as a teacher

Reflection has become an integral part of my own personal evaluation. I read an article by Rosemary Buckley (1988) and I realized that the way in which she was describing reflection was something which I myself had been doing for some time without actually realizing it. I began to notice that each day at school I was seeing and hearing things that made me think. I did not expect this as after two years of teaching I felt that I knew just what I had to teach and how I could do it. I had never really thought about the girls in my science classes. I didn't consider that interacting with the girls, talking to them, and listening to their views about science and teaching would alter the way in which I thought of myself as a teacher.

I thought some more about my own philosophy of teaching and learning and I began to wonder how I could explore whether what I was doing as a teacher was consistent with what I said and believed about teaching and learning. I moved away from my own thoughts and began to reflect on what had begun this process of thought - my experiences with the learners. This

reflection led to reading books and articles in journals and to discussing ideas with colleagues and to reflecting even more. At first it was scary to admit that I didn't have all the answers and that reflection was leading to even more questions. I was encouraged by the fact that I was not alone and that many of my colleagues were questioning and reflecting too.

I found that I was watching the students with new eyes, really listening to them, interacting with them, and making notes and reflecting. I began to appreciate the learners for their uniqueness as I understood more about who each one was and where each one was going. I realized that their conversations and thoughts were highly prized resources. The simple things which I observed in the class became profound when I reflected upon them in my brain. I was looking at myself in a whole new way.

All this valuable information was helping me to find a sense of direction so that I could help my students by adjusting the environment to offer boundless possibilities for learning. As I reflected I became humbler and removed myself from the pedestal which I had created for myself and I began to see myself not in front of the students handing out knowledge, but working together with them and discovering with them. This enabled me to learn more about myself and my students.

I realized that reflection was an ongoing process and that it would give me no one right answer. I had been used to asking questions and coming away with answers but reflection did not answer my questions; it led me to ask even more questions. Reflection has opened up a whole new horizon for me; it is an exciting adventure. It does not begin or end in the classroom but has become a whole new way of knowing which has helped me to grow both in my personal as well as professional life.

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